

ENVIRONMENTALLY-COMPLIANT INORGANIC MATERIALS FOR CORROSION AND WEAR PROTECTION OF STRUCTURAL METALS ON MILITARY AIRCRAFT AND WEAPON SYSTEMS

PROJECT OVERVIEW

Increasingly dynamic and stringent environmental, safety, and occupational health (ESOH) regulations and removal of commonly used carcinogenic hard chrome plating requires novel coating material alternatives to maintain DoD readiness. This project seeks to optimize, demonstrate/validate, and transition an environmentally benign inorganic coating of amorphous-iron (AM-Fe) for high-strength steel applications for US military aircraft and weapon systems. The new coating, being developed by Inovati Inc., must maintain current competitive protection characteristics (i.e. comparable/improved corrosion protection and wear resistance) to current coating technologies to decrease maintenance costs and prevent hazardous exposure.

BENEFITS

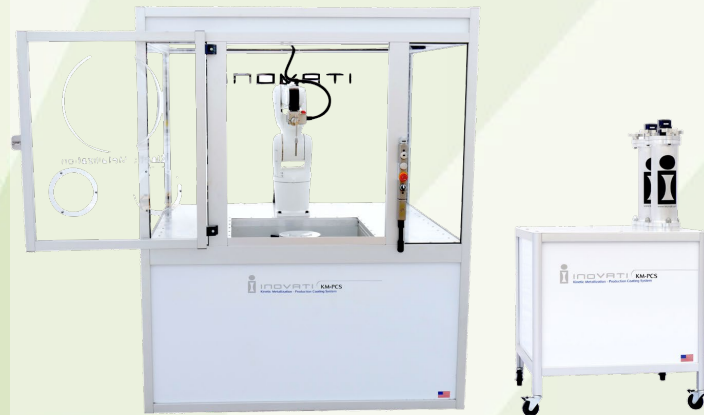
Replacement for hazardous Electrolytic Hard Chrome (EHC) and HVOF WC-Co coatings impacts life-cycle sustainment costs, efficacy, environmental sustainment, and worker safety and health. The AM-Fe coating technology improves the DoD sustainment strategies and eliminates audit shutdowns associated with non-compliance with ES&H regulations. The technology is free of all materials found on the OSD action and watch list to ensure longevity of compliance.

PATH FORWARD

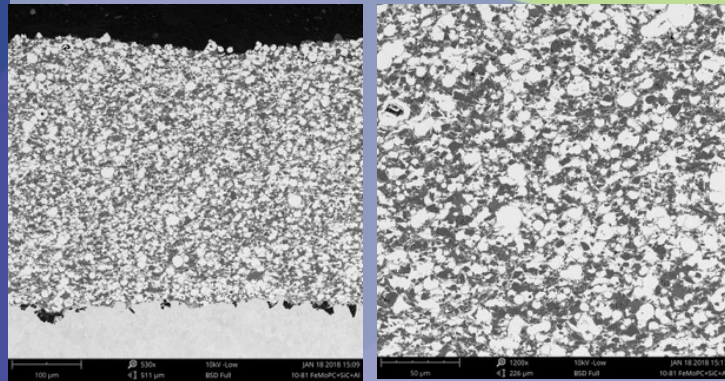
Following final coating development, the program will transition the formulation and parameters of the environmentally benign inorganic coating for repair and maintenance of aircraft components within the Department of Defense beginning with component validation at the landing gear repair center at Ogden Air Logistics Complex, Hill AFB. After initial transition and validation at Hill AFB, the technology will be brought to other interested parties including the Navy and the Army.

DoD Executive Agent

Office of the Assistant Secretary of the Army for Installations, Energy, and Environment



Inovati Inc.'s Kinetic Metallization-Production Coating System (KM-PCS) used for application of the amorphous iron (AM-Fe) inorganic coating.



Micrographs of AM-Fe coating showing homogenous distribution of hard phase Silicon-Carbide (dark color) particles within the high density metal matrix for improved wear resistance.

FOR FURTHER INFORMATION

National Defense Center for Energy and Environment

<http://www.denix.osd.mil/ndcee/home>

United States Air Force – Air Force Research Laboratory – Materials and Manufacturing Directorate

<https://www.wpafb.af.mil/afri/rx/>